ID 342558

VIBRATION TEST EQUIPMENT

MODEL 400AT/R(500R)

REMOTE INTERFACE

MP MASTER
MA34560

UNHOLTZ-DICKIE CORPORATION

MODEL 400AT/R(500R)

REMOTE INTERFACE

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REMOTE INTERFACE FUNCTIONAL DESCRIPTION

The remote interface consists of a set of eighteen input signals and a set of seventeen output signals for use in remotely controlling the random vibration test. All signals are optically isolated to minimize possible ground loop problems and to allow for remote operation from customer equipment operating from a different power source. The anode and cathode for each input signal are provided at the UD320 (UD310) J1 connector. The collector and emitter of the transistor driver for each output driver are provided at the UD320 (UD310) J2 connector.

Assertion level for inputs is defined as current flow from anode to cathode. A floating anode-cathode input pair is interpreted as a deasserted state.

Assertion level for outputs is defined by the output transistor in the OFF state with no current flow from the collector to emitter. A deasserted state is provided when the output transistor is turned ON and a current flows from collector to emitter.

Input commands are strobed into the controller by first asserting the appropriate input command signal line(s) and then providing a strobe edge by changing from a deasserted state to an asserted state at the STROBE signal. The input command signals correspond to the function key commands used in the KEYBOARD mode. The input signal states are latched by the strobe edge and the appropriate action taken by the controller host computer. Note that all input signals require a STROBE edge except for the REMOTE ABORT input. This signal is level sensitive such that an assertion level immediately initiates an abort. The controller responds by ramping the drive output signal to zero volts.

The controller provides status information on the output status signals to indicate the current mode of operation. The RDY/$\overline{\text{BUSY}}$ output indicates when the controller is ready to accept a new remote command input. No input commands are detected when this RDY/$\overline{\text{BUSY}}$ signal is deasserted.

The same spectrum graphs that are displayable from the KEYBOARD mode are also available to display, hardcopy, or to save on the hard disk. Displays may be selected from the keyboard. Prints and data saves may be initiated by keyboard commands or remote input commands. The F3-AUTO, F5-MANUAL, F7-OPEN LOOP and F9-STANDBY keys are disabled at the keyboard. The F1-ABORT key is always enabled

REMOTE MODE OPERATION

Random vibration tests that are initiated and manipulated from the keyboard are run in the KEYBOARD mode of operation. Random tests that are initiated and manipulated via the Remote Interface (connectors J1 and J2 at the UD320) are run in the REMOTE mode. The vibration controller must be placed in the appropriate mode before testing can be properly started.

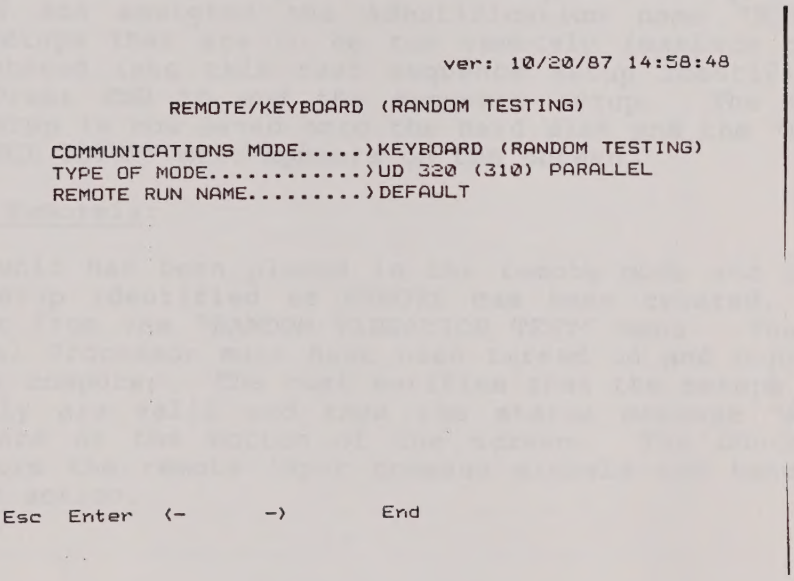
REMOTE/KEYBOARD Mode Selection:

The operator should first go to the "MAJOR OPERATIONAL MODES" menu. The "F2" key on the screen is labeled F2=REMOTE/KEYBOARD as shown below:

```
                    MAJOR OPERATIONAL MODES

F1 = RANDOM TEST                    F2 = REMOTE/KEYBOARD

F3 = SINE TEST                      F4 = MEASUREMENT/ANALYZE

F5 = SINE ON RANDOM TEST            F6 = MAINTENANCE/DIAGNOSTICS

F7 = SHOCK TEST                     F8 = HELP

F9 = RANDOM ON RANDOM TEST          F10 = EXIT

SELECT A FUNCTION KEY
```

Press the "F2" key.

The following appears on the screen:


ver: 10/20/87 14:58:48
REMOTE/KEYBOARD (RANDOM TESTING)
COMMUNICATIONS MODE.....)KEYBOARD (RANDOM TESTING)
TYPE OF MODE.....)UD 320 (310) PARALLEL
REMOTE RUN NAME.....)DEFAULT
Esc Enter (- -) End

By pressing the "ENTER" key at the communication mode line, the mode may be toggled between "KEYBOARD" and "REMOTE". Place the unit into the "REMOTE" mode.

Move the cursor down to the next item. The type of mode is labeled "UD320 (UD310) PARALLEL". This refers to the use of the optically isolated remote input command signals (UD320 or UD310 J1) and output status signals (UD320 or UD310 J2). This is the only type of remote interface that currently exists for the unit.

Move the cursor down to the next item. The Remote Run Name may be toggled between OPERATOR ENTRY and DEFAULT by pressing the "ENTER" key. By placing this line to "OPERATOR ENTRY", the operator may assign a run name from the keyboard prior to remotely starting each test. The controller will prompt the operator for a new run name for each test run remotely. By placing this line to the "DEFAULT" position, a run name is automatically assigned by the controller for each test run in the remote mode.

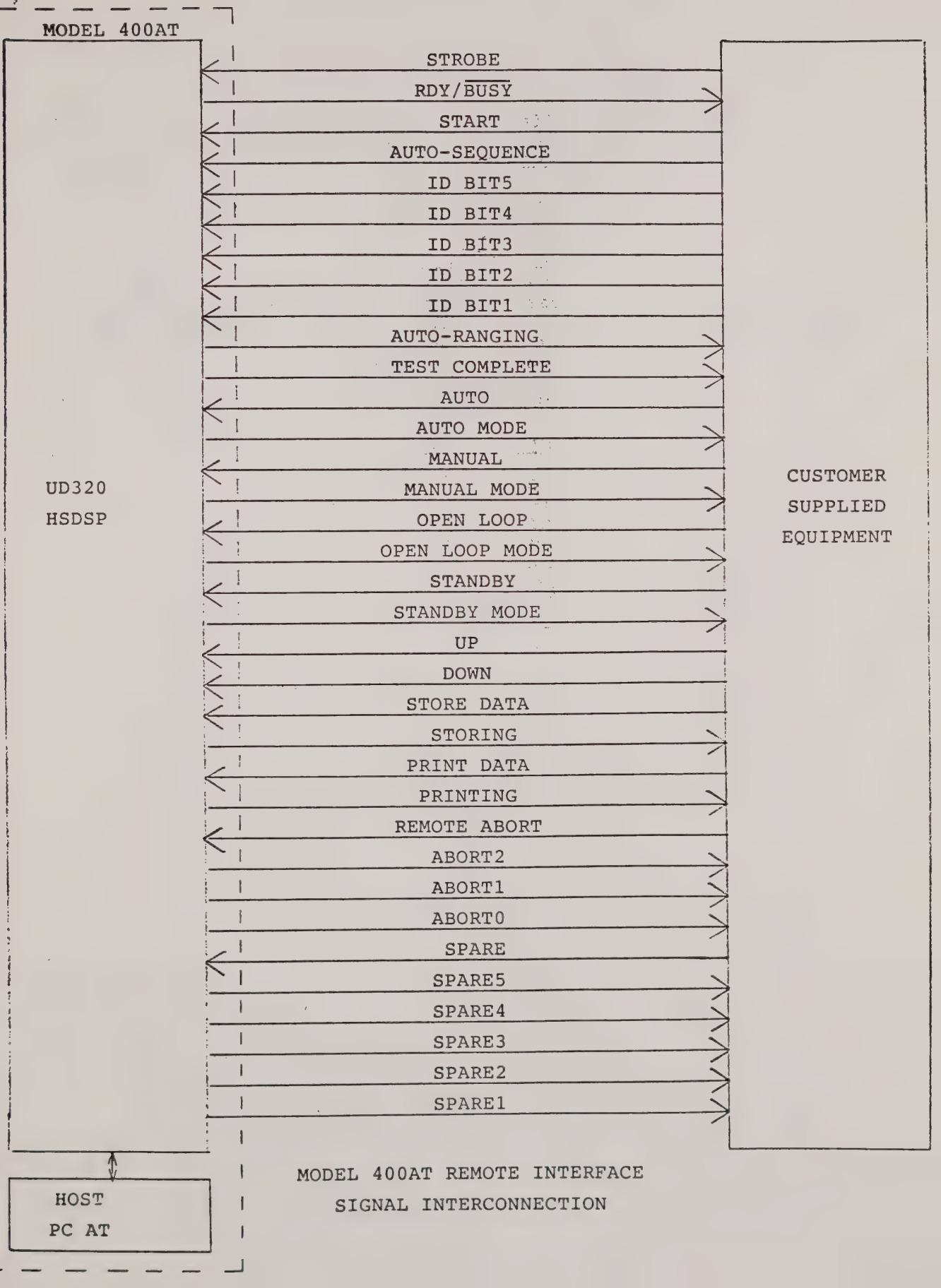
Press END after all selections have been made to save these selections. The unit is now in the REMOTE mode of operation. The MAJOR OPERATIONAL MODES menu appears on the screen.

Establish REMOTE Test Sequence:

Press F1 - RANDOM from the "MAJOR OPERATIONAL MODES" menu. The "RANDOM VIBRATION TEST" menu appears on the screen. Press F2 for "Test Sequence Setup". A test sequence setup must be established and assigned the identification name "REMOTE". All test setups that are to be run remotely (maximum of 28) must be entered into this test sequence setup identified as REMOTE. Press END to end the sequence setup. The REMOTE sequence setup is now saved onto the hard disk and the "RANDOM TEST SEQUENCE SETUP" menu appears on the screen.

Start Test Remotely:

After the unit has been placed in the remote mode and a test sequence setup identified as REMOTE has been created, press F7-Run Test from the "RANDOM VIBRATION TEST" menu. The High Speed Signal Processor must have been turned on and connected to the host computer. The host verifies that the setups to be run remotely are valid and then the status message "Remote Mode" appears at the bottom of the screen. The controller then monitors the remote input command signals and takes the appropriate action.



MODEL 400AT REMOTE INTERFACE
SIGNAL INTERCONNECTION

REMOTE INTERFACE CONNECTOR PIN ASSIGNMENT

J1 - INPUT SIGNALS

MALE CONNECTOR

PIN # OPTO-COUPLER ANODE INPUT	SIGNAL NAME	PIN # OPTO-COUPLER CATHODE INPUT
1	REMOTE ABORT	20
2	STROBE	21
3	START	22
4	ID1	23
5	ID2	24
6	ID3	25
7	ID4	26
8	ID5	27
9	AUTO-SEQUENCE	28
10	SPARE	29
11	DOWN	30
12	UP	31
13	STANDBY	32
14	OPEN LOOP	33
15	MANUAL	34
16	AUTO	35
17	PRINT	36
18	STORE DATA	37
19	NOT USED	

REMOTE INTERFACE SIGNAL DESCRIPTION

INPUTS

ANODE
PIN NO

1 REMOTE ABORT - When asserted, this signal causes the test to abort. The drive signal is ramped to zero volts over a single frame time and the appropriate Abort Output bits are set.

2 STROBE - A transition to an asserted level is used to strobe all inputs, except for the remote abort, into the UD320 (UD310). Input signals must be valid for at least one hundred microseconds before and after the strobe edge.

3 START - This signal is strobed in using the STROBE edge. It is recognized only if no other test has been run before or if the previous test has finished or aborted. When asserted, the ID bits or the AUTOSEQUENCE signal is used to select a test set-up. The test starts with the low vibration level auto-ranging and then proceeds to the selected AUTO or MANUAL mode.

4-8 ID BITS 1 - 5 - The Identification Bits (1-5) are strobed in using the STROBE edge. They are recognized only when the START signal is asserted and the AUTO-SEQUENCE signal is not asserted. The ID Bits (binary coded) are used to select one of the twenty-eight test setups contained in the remote sequence setup. Bit 5 is the MSB and Bit 1 is the LSB. The first test in the remote test sequence is selected by the Code 00000 and the twenty-eighth test selected by 11011 (where 1 = assertion and ø = deassertion).

9 AUTO-SEQUENCE - This signal is strobed in using the STROBE edge. It is recognized only when the start signal is asserted. When AUTO-SEQUENCE is valid, the next test in succession from the remote sequence setup is selected.

10 SPARE

11& 12 DOWN AND UP - These signals are strobed in using the STROBE edge. They are recognized when the controller is in the MANUAL or OPEN LOOP modes. Each strobed UP (DOWN) signal causes the level to be increased (decreased) in 1 dB steps. This is identical to pressing the UP and DOWN arrow keys in the KEYBOARD mode.

13 STANDBY - This signal is strobed in using the STROBE edge. It is recognized after a test is started and auto-ranging is complete. When asserted, the controller is placed in the STANDBY mode. The drive signal is ramped

to zero volts over a single frame time. The control and drive spectra are saved. The test may be continued some time later by strobing an asserted AUTO, MANUAL or OPEN LOOP signal. The stored control and drive spectra are used in continuing the test. This eliminates the need for auto-ranging again. This is identical to pressing the F9 - STANDBY key in the KEYBOARD mode.

14 OPEN LOOP - This signal is strobed in using the STROBE edge. It is recognized after a test has been started and auto-ranging is complete. When asserted, the controller is placed in the OPEN LOOP mode. This is identical to pressing the F7 - OPEN LOOP key in the KEYBOARD mode. The UP and DOWN input signals are active in the OPEN LOOP mode.

15 MANUAL - This signal is strobed in using the STROBE edge. It is used in conjunction with the START signal to begin a test in the MANUAL mode. It is also used during the test to place the controller to the MANUAL mode from the AUTO, OPEN LOOP or STANDBY modes. It is identical to pressing the F5 - MANUAL key in the KEYBOARD mode. The UP and DOWN input signals are active in the MANUAL mode.

16 AUTO - This signal is strobed in using the STROBE edge. It is used in conjunction with the START signal to begin a test in the AUTO mode. It is also used during the test to place the controller to the AUTO mode from the MANUAL, OPEN LOOP or STANDBY modes. This is identical to pressing the F3 - AUTO key in the KEYBOARD mode.

17 PRINT - This signal is strobed in using the STROBE edge. It recognized after a test has been started and auto-ranging is complete. When asserted, the fully annotated displayed test graph is printed. This is identical to pressing the F4 - PRINT SCREEN key in the KEYBOARD mode.

18 STORE DATA - This signal is strobed in using the STROBE edge. It is recognized after a test has been started and auto-ranging is complete. When asserted, the current control PSD, Drive PSD, Analysis Channel PSD, and selected transmissibility ratio (Analysis PSD/CONTROL PSD) are stored onto the hard disk. This is identical to pressing the F6 - STORE DATA key in the KEYBOARD mode.

REMOTE INTERFACE CONNECTOR PIN ASSIGNMENT

J2 - OUTPUT SIGNALS

FEMALE CONNECTOR

PIN # OPTO-COUPLER COLLECTOR OUPTUT	SIGNAL NAME	PIN # OPTO-COUPLER EMITTER OUTPUT
1	AUTO-RANGING	20
2	STANDBY MODE	21
3	OPEN LOOP MODE	22
4	MANUAL MODE	23
5	AUTO MODE	24
6	PRINTING	25
7	STORING	26
8	RDY/$\overline{\text{BUSY}}$	27
9	ABORT0	28
10	ABORT1	29
11	ABORT2	30
12	SPARE1	31
13	SPARE2	32
14	SPARE3	33
15	SPARE4	34
16	SPARE5	35
17	TEST COMPLETE	36
18	NOT USED	37
19	NOT USED	

REMOTE INTERFACE SIGNAL DESCRIPTION

OUTPUTS

COLLECTOR PIN NO.

1 AUTO-RANGING - This signal is asserted at the start of the test during the low vibration level auto-ranging procedure while the UD320 (UD310) automatic input scaling occurs and equalization proceeds. This signal is then deasserted when the test leaves auto-ranging and goes to the specified test level.

2 STANDBY MODE - This signal is asserted when the unit has been placed in the STANDBY mode by the remote strobed STANDBY command. It is deasserted when a remote strobed AUTO, MANUAL, OPEN LOOP command is received. It is also deassorted when an abort condition is detected.

3 OPEN LOOP MODE - This signal is asserted when a remote strobed OPEN LOOP command places the controller in the OPEN LOOP mode. It is deasserted when the unit receives a remote strobed AUTO, MANUAL or STANDBY command. It is also deasserted when an abort condition is detected.

4 MANUAL MODE - This signal is asserted after auto-ranging, if started in the MANUAL mode. It is deasserted when the unit receives a remote strobed AUTO, OPEN LOOP or STANDBY command. It is also deasserted when an abort condition is detected. It is asserted again when a remote strobed MANUAL command places the controller back in the MANUAL mode.

5 AUTO MODE - This signal is asserted after auto-ranging, if started in the AUTO mode, when the test is proceeding at the level(s) specified. It is deasserted when the unit receives a remote strobed MANUAL, OPEN LOOP or STANDBY command. It is asserted again when a remote strobed AUTO command places the controller in the AUTO mode. It is also deasserted when the test ends normally or when an abort condition is detected.

6 PRINTING - This signal is asserted when the currently displayed test graph is being printed as a result of a remote strobed PRINT command. It is deasserted when the Print operation is complete.

7 STORING - This signal is asserted when test data is being stored, as a result of a remote strobed STORE DATA command. It is deasserted when the Store operation is complete.

8 RDY/$\overline{\text{BUSY}}$ - When asserted, this signal indicates the unit is ready to accept a new strobed remote command. When the unit is in the KEYBOARD mode or while the unit is recognizing and processing a remote strobed command, this signal indicates a busy condition (deasserted).

9-11 ABORT 0-2 - The abort bits indicate the type of abort condition:

210		210	
000	- No Abort	100	- Abort, Auto Ranging
001	- Abort, grms	101	- Abort, Keyboard F1
010	- Abort, Lines Exceeded	110	- Abort, External or Remote Signal
011	- Abort, Channel grms Exceeded	111	- Abort, Pusnbutton

12-16 SPARE 1-5

17 TEST COMPLETE - This signal is asserted when the test has completed the level(s) and duration(s) specified.

NOTES

1) Inputs and outputs are optically coupled to isolate the UD320 (UD310) ground from the remote equipment ground.

   Input signals are asserted (logic one) by supplying current to the infrared emitting diode. The anode (through a series resistor) and cathode pair are provided for each input signal at the J1 male connector.

   Outputs are asserted (logic one) with the output transistor turned off. Outputs are deasserted with the output transistor turned on resulting in current flow from the collector to emitter. The collector and emitter pair are providid for each output signal.

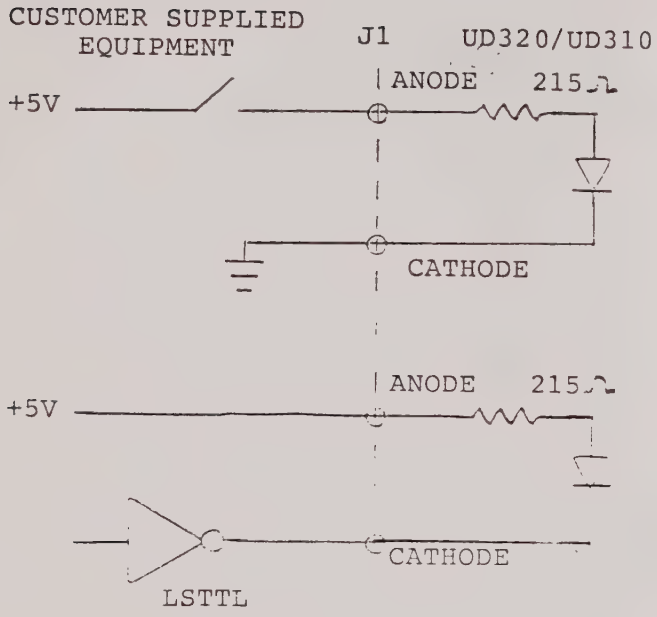
2) Unit is placed in the REMOTE or KEYBOARD mode by the operator at the keyboard. Unit is normally in the KEYBOARD mode.

3) When a test is being run in the REMOTE mode, the F3 - AUTO, F5 - MANUAL, F7 - OPEN LOOP and F9 - STANDBY function keys are not active from the keyboard.

4) The remote sequence setup is used for running remote tests.

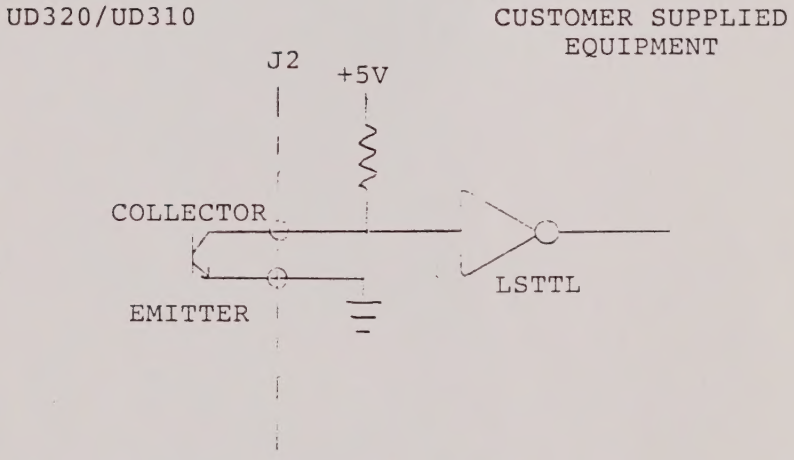
5) To minimize the number of signal lines used for remotely running a single test, the START and AUTO anode signal lines may be externally tied together, asserted with five volts, and all other inputs left floating (deasserted). A transition to an asserted (+5V) level on the STROBE anode signal line then starts a test in the AUTO mode and proceeds to completion according to the levels specified in the level schedule of the test setup. Note that the START, AUTO and STROBE cathode signal lines should all be connected to the remote equipment common ground.

REMOTE INTERFACE AND
EXTERNAL START/STOP INTERFACE
TYPICAL INPUT CONNECTION



NOTE: INPUT IS LOGIC ONE WHEN THE INFRARED EMITTING DIODE IS FORWARD BIASED WITH 15 ma FORWARD CURRENT.

REMOTE INTERFACE AND
EXTERNAL START/STOP INTERFACE
TYPICAL OUTPUT CONNECTION



NOTE: OUTPUT IS LOGIC ONE WHEN CURRENT FLOW (MIN 2 ma) OCCURS FROM THE COLLECTOR TO EMITTER

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